

# CLAIMS

What is claimed is:

1. A method for forming a gate dielectric layer comprising:  
providing a semiconductor substrate;  
thermally oxidizing the semiconductor substrate within a thermal oxidizing atmosphere comprising a halogen getter material to form a gate dielectric layer upon a thermally oxidized semiconductor substrate.
2. The method of claim 1 wherein the semiconductor substrate is a silicon semiconductor substrate.
3. The method of claim 1 wherein the semiconductor substrate is a silicon-germanium alloy semiconductor substrate.
4. The method of claim 1 wherein the gate dielectric layer is formed from a non-nitrided silicon oxide material.
5. The method of claim 1 wherein the halogen getter material is a chlorine halogen getter material.
6. The method of claim 5 wherein the chlorine halogen getter material is selected from the group consisting of chlorine, hydrogen chloride, and one to three carbon atom chlorocarbons and hydrochlorocarbons.

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7. The method of claim 1 wherein the thermal oxidizing atmosphere is selected from the group consisting of wet thermal oxidizing atmospheres and dry thermal oxidizing atmospheres.
8. A method for forming a gate dielectric layer comprising:  
    providing a semiconductor substrate;  
    thermally oxidizing the semiconductor substrate within a first thermal oxidizing atmosphere comprising a halogen getter material to form a first gate dielectric layer upon a once thermally oxidized semiconductor substrate; and  
    thermally oxidizing the once thermally oxidized semiconductor substrate within a second thermal oxidizing atmosphere not comprising a halogen getter material to form a second gate dielectric layer over a twice thermally oxidized semiconductor substrate.
9. The method of claim 8 wherein the semiconductor substrate is a silicon semiconductor substrate.
10. The method of claim 8 wherein the semiconductor substrate is a silicon-germanium alloy semiconductor substrate.
11. The method of claim 8 wherein the first gate dielectric layer is formed from a non-nitrided silicon oxide material.
12. The method of claim 8 wherein the second gate dielectric layer is formed from a nitrided silicon oxide material.

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13. The method of claim 8 wherein the halogen getter material is a chlorine halogen getter material.

14. The method of claim 13 wherein the chlorine halogen getter material is selected from the group consisting of chlorine, hydrogen chloride, and one to three carbon atom chlorocarbons and hydrochlorocarbons.

15. The method of claim 8 wherein the first thermal oxidizing atmosphere is selected from the group consisting of wet thermal oxidizing atmospheres and dry thermal oxidizing atmospheres.

16. The method of claim 8 wherein the second thermal oxidizing atmosphere is selected from the group consisting of wet thermal oxidizing atmospheres and dry thermal oxidizing atmospheres.

17. The method of claim 8 wherein the first gate dielectric layer is stripped from the once thermally oxidized semiconductor substrate prior to forming the second gate dielectric layer over the twice thermally oxidized semiconductor substrate.

18. The method of claim 8 wherein the second gate dielectric layer is formed upon the first gate dielectric layer which is formed upon the twice thermally oxidized semiconductor substrate.

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19. A semiconductor product comprising a semiconductor substrate having a first active region having formed therein a first field effect transistor device and a second active region having formed therein a second field effect transistor device, wherein:

the first field effect transistor device has formed therein a bilayer gate dielectric layer comprising a nitrided silicon oxide material layer laminated onto a non-nitrided silicon oxide material layer; and

the second field effect transistor device has formed therein a single layer gate dielectric layer.

20. The semiconductor product of claim 19 wherein:

the bilayer gate dielectric layer comprises the nitrided silicon oxide material layer laminated to the non-nitrided silicon oxide material layer in turn laminated to the semiconductor substrate; and

the single layer gate dielectric layer is formed of a non-nitrided silicon oxide material.